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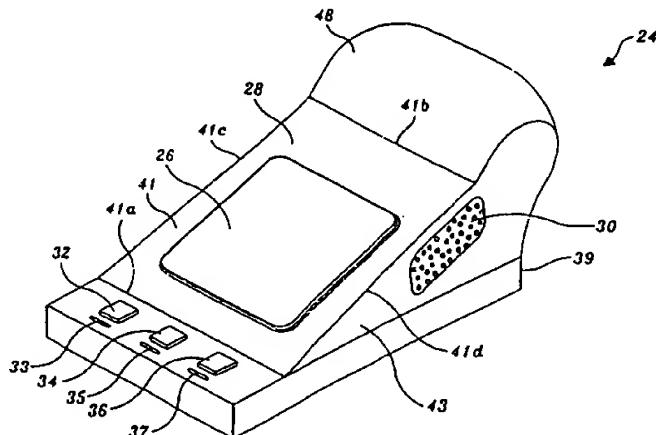
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

|   |           |   |
|---|-----------|---|
| (51) International Patent Classification 6 :<br><b>G06K 11/18, G06F 3/033, 3/023</b>  | <b>A3</b> | (11) International Publication Number: <b>WO 95/09402</b><br>(43) International Publication Date: <b>6 April 1995 (06.04.95)</b>  |
| (21) International Application Number: <b>PCT/US94/10875</b>  |           | (81) Designated States: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). |
| (22) International Filing Date: <b>26 September 1994 (26.09.94)</b>   |           |   |
| (30) Priority Data:<br><b>08/128,985 28 September 1993 (28.09.93) US</b>  |           | <b>Published</b><br><i>With international search report.</i><br><i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>   |
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(54) Title: **TOUCH-PAD CURSOR CONTROL DEVICE**

## (57) Abstract

A cursor control device (20) suitable for use with a computer-controlled display (66) is disclosed. The cursor control device (20) includes a touch-pad controller (24) and interface electronics (22) that produce cursor control output signals (40) suitable for controlling the location of a cursor on the computer-controlled display (66). The touch-pad controller (24) includes a housing (28) having: (i) a base (39); (ii) a surface (41) that slopes upward from the base (39); and a pair of side walls (43) that extend from the base (39) to the sloped surface (41). The slope angle is greater than 10°, and preferably is greater than 20°. A touch sensitive pad (26) mounted in the sloped surface (41) senses the location of an object, such as a finger pressing against the touch sensitive pad (26). Further, a thumb switch (30) is mounted in one side wall (43) of the housing (28). The interface electronics (22) are coupled to the touch sensitive pad (26) and to the thumb switch (30) and determine the location and movement (distance and direction) of an object pressing against the touch sensitive pad (26) and the status of the thumb switch (30). The previously mentioned cursor control output signals (40) are produced by the interface electronics (22) based on the object location and movement determinations.

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## INTERNATIONAL SEARCH REPORT

I. International Application No  
PCT/US 94/10875

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 G06K11/18 G06F3/033 G06F3/023

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 G06K G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| Y          | US,A,4 977 397 (WEN-CHIEH KUO ET AL.) 11 December 1990<br>see column 2, line 31 - line 68<br>see figures 1,2<br>---         | 1-4,10                |
| Y          | WO,A,92 14232 (M. COOK) 20 August 1992<br>see page 9, paragraph 2<br>see page 10, paragraph 2<br>see figures 4A,4B,6<br>--- | 1-4,10                |
| A          | US,A,4 550 221 (SCOTT MABUSTH) 29 October 1985<br>see abstract; figures 1,2<br>----   | 1                     |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*'A' document defining the general state of the art which is not considered to be of particular relevance
- \*'E' earlier document but published on or after the international filing date
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Date of the actual completion of the international search

23 January 1995

Date of mailing of the international search report

10.05.95

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

PCT/US 94/ 10875

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
  
  
  
2.  Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
  
  
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

**SEE ANNEXED SHEET**

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
  
  
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-5, 10

**Remark on Protest**

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

1. Claims 1-5, 10: Touch-pad including an housing having an inclined upper-surface, a switch mounted in a sidewall of the housing and a palm support located at the upper portion of the inclined surface.
2. Claims 6-9, 19, 20: Touch-pad including display select switch means to select the display on which a controlled cursor is displayed.
3. Claims 11-15: Touch-pad wherein cursor is controlled by using position and rate of movement of an object over the pad.
4. Claims 16-18: Touch-pad whereby a cursor is controlled in absolute mode or in relative mode and method to reposition the cursor.

The first invention is (claims 1-5, 10):

A cursor control device comprising a touch-pad and associated interface electronics to control the position of a cursor on a computer-controlled display, the touch-pad including an housing having an inclined upper-surface where a touch sensitive pad is located, a switch mounted in one of the side walls of the housing and a palm support located at the upper portion of the inclined upper-surface.

The 2nd invention is (claims 6-9,19,20):

A cursor control device comprising a touch-pad and associated interface electronics wherein the touch pad includes display select switch means in order to select the display on which a controlled cursor is displayed.

The 3rd invention is (claims 11-15):

A cursor control device comprising a touch-pad and associated interface electronics wherein the interface electronics determines the position and rate of movement of an object across a touch sensitive pad and uses both parameters to produce cursor control signals.

The 4th invention is (claims 16-18):

A cursor control device comprising a touch-pad and associated interface electronics controlling the location of a cursor in a computer-controlled display in absolute mode or in relative mode and method to reposition the cursor.

The technical link is the following:

A cursor control device comprising a touch-pad and associated interface electronics to control the position of a cursor on a computer-controlled display, the touch-pad including an housing having an inclined upper-surface where a touch sensitive pad is located and a switch mounted in one of the side walls of the housing.

However, this link is not inventive because of the 2 documents USA 4977397 and WOA 9214232.

Thus, according to Rule 13 PCT non-unity A POSTERIORI is detected for inventions 2,3,4.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International Application No

PCT/US 94/10875

| Patent document cited in search report | Publication date | Patent family member(s) |         | Publication date |
|--|------------------|-------------------------|---------|------------------|
| US-A-4977397                           | 11-12-90         | NONE                    |         |                  |
| WO-A-9214232                           | 20-08-92         | AU-A-                   | 1377992 | 07-09-92         |
| US-A-4550221                           | 29-10-85         | NONE                    |         |                  |

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